DOCUMENT RESUME

ED 203 510 EA 013 702

AUTHOR Hayman, John
TITLE Relationship of Strategic Planning and Futures Methodologies.
PUB DATE Apr 81
NOTE 23p.; Paper presented at the Annual Meeting of the American Educational Research Association (Los Angeles, CA, April 13-17, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Decision Making; Environmental Influences; Futures (of Society); Information Needs; *Long Range Planning; *Models; Planning; Systems Approach
IDENTIFIERS *Strategic Planning; Uncertainty

ABSTRACT

Today's unprecedented rate of change requires that decision-makers use effective procedures to deal with the increasing complexity and uncertainty regarding the future results of their decisions. Strategic planning is a middle- and long-range method that fills this need. Its holistic, general-systems orientation is the only way to handle the amount of planning and information required. Decision-makers need information on three factors: the system (or organization) for which planning is being done, its environment, and the system-environment relationship. However, because more information is needed as uncertainty increases, the information must be organized in a model if the decision-maker is to avoid being swamped in data. Strategic planning successfully structures the needed information, using qualitative and quantitative models as well as organizational and political theory. Political theory is included because planning in a democracy is a political activity in which the populace must take part. Modelling in strategic planning can include contextual mapping, relevance trees, and other methods which have been called "futures methodologies." There is, however, no set of futures methodologies separate from those of strategic planning. (RW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED203510

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Relationship of Strategic Planning and Futures Methodologies

by

John Hayman
Professor of Education
Auburn University

Presented at the

1981 Annual Convention of the
American Educational Research Association

Los Angeles, California

April, 1981

EA 013 702

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
J. Hayman
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Relationship of Strategic Planning
and Futures Methodologies

by

John Hayman
Professor of Education
Auburn University

A. Decisions in an Era of Rapid Change and Growing Uncertainty

Society is moving from the era of the Industrial Revolution, with its emphasis on machines and their ability to convert energy into work, to the Age of Technology, with its emphasis on automation, on large-scale information transfer and use, and on the literal expansion of man's intellectual capabilities (Bell, 1973; Boulding, 1964). Change is occurring faster than at any time in human history, and the level of uncertainty as to future events is unprecedented (Wildavsky, 1979, p. 36).

The technology revolution is interacting with and being influenced by the energy crisis in the U.S. and by international political instability. Leaders in this country and others show themselves increasingly surprised by the pace of events and by the events themselves. The problem exists both in business and in government, and failure to deal with it has led to serious mistakes and costly consequences. Examples include the recent crisis in the world's steel and shipbuilding industries, the current difficulties in the automobile industry in the U.S., and the political situations in Iran, Afghanistan, and Cuba.

There is pressing need for strategic planning, an approach that provides decision makers procedures to deal more effectively with complexity and

---

Presented at the 1981 Annual Convention of the American Educational Research Association, Los Angeles, California.

uncertainty. Strategic planning and decision making in the face of uncertainty have historically been a top management responsibility, but they have been handled with mixed success. Policy makers today are increasingly being forced to make important decisions which affect future events and which depend on highly uncertain external factors.

Another aspect of the age is the growth in the production and use of knowledge. The rate of knowledge growth has expanded dramatically in the twentieth century and has reached enormous proportions. The amount of knowledge produced in a single decade now exceeds all of that produced in the first 6,000 years of recorded history (Anderla, 1973). Whether or not this knowledge, and the technology which it has produced, will ultimately be helpful or harmful to human well-being is uncertain.

The situation represents a stern challenge, because, as Peterson has noted, "for every giant step we take, we seem to slip backward a little (1979, p. 28)." Technology has demonstrated the alarming trait of creating more problems than it solves. As Mumford observes:

> We are now faced . . . with the situation Goethe foresaw in the fable of the Sorcerer's Apprentice: we have achieved the magic formula for automatically increasing the supply of scientific knowledge; but we have forgotten the Master Magician's formula for regulating or halting the flood, and so are on the point of drowning in it (Mumford, 1973, p. 166).

These trends have led to feelings of insecurity and of declining confidence in traditional societal institutions. There is a sense of dislocation, of isolation, of being buffeted about by forces over which individuals have no control. People feel powerless in trying to determine what happens, and this leads to overall feelings of frustration (Toffler, 1970, Heilbroner, 1975,

p. 14). A symptom is the increase in terrorism in many parts of the world.

This is an age where strong leadership is needed, and an imperative for strong leadership is to exercise control over events and not simply to react. Given the challenges which exist, however, how to exercise leadership is a major question.

Planning experts state that in this era we cannot expect stable organizations, in government, business, or otherwise, that will endure even for our own lifetimes. We must learn to understand, guide, influence and manage the transformations which are occurring. Institutions must be changed into "learning systems," that is, systems capable of bringing about their own continuing transformation (Chadwick, 1978, pp. 337-339). In the broadest sense, the problem of control and of leadership is to transform institutions so that they are capable of dealing with the challenges presented, while, at the same time, preserving the basic values of the society.

B. Strategic Planning: A Response to the Challenge

The situation clearly calls for planning, but planning of a type and of a level of influence that has seldom been achieved. Planning is by its nature future oriented. It is a process of human thought for the future and of action based on that thought. It is optimistic, for it assumes that control over future events is possible (Chadwick, 1978, p. 75). It is most of all a human conception that depends on human participation.

1. Types of Planning

"The future" refers to tomorrow, and it may also refer to the turn of the next century. Organizations must be concerned with both the immediate and

the long range, but the focus differs according to decision role. According to Soderberg (1979), planning is carried out in different time perspectives:

Operational or technical planning involves a day-by-day perspective and is not concerned with long-term consequences. Attention is directed toward achieving short-term objectives, within existing resources and under existing constraints, and the inevitable shortcomings of the situation are accepted. Beer refers to this activity as programming or planning on the basis of actuality (1972, pp. 206-209). It is clearly a lower-level management activity, and, while it is important that it be carried out efficiently, this is the type of activity which should occur semi-autonomously. The system should be designed so that this type of planning and decision making occurs, at a suitable level of proficiency, with little direct involvement from higher management levels.

Compound or Middle-range planning involves a year-by-year perspective and thus is more long range in its outlook. Policies are operationalized through statements of objectives and of related activities which are possible within available resources. Forecasting and analysis of future conditions and events is involved, and an attempt is made to develop new resources and to remove constraints. If policy is defined in the usual way, then this level of planning should not be a policy matter, though it is quite often approached as such. Kast and Rosenzweig (1972), say that, "Policies are the broadest of standing plans and are general guides to organizational behavior. At the institutional level, policies generally set broad premises and constraints within which further planning activities take place."

Complex or philosophical planning is at the broadest policy level, and should be a primary concern of the top levels of management. It is long range

and has a decade-by-decade perspective. Conditions which are likely to exist in the intermediate and long-range futures are considered, together with the interplay of these conditions with larger issues of societal values and lifestyles. Outcomes which will be considered valuable and desirable are determined at this planning level. This level is sometimes referred to as "normative" planning, indicating that it is concerned with setting broad norms or standards. In a stable, unchanging society, there is little need for normative planning, but when rapid change threatens basic values, then this type of planning becomes important indeed.

The first level of planning is usually handled rather well. The second on the average is handled less effectively than the first, but is almost always done at some minimum level. The third, however, is not handled well. Given the challenges of the time in which we live, it is imperative that a better balance be achieved, and that organizations focus more on the longer range and on control of future events.

In this paper, the term "strategic planning" will be used in the broad sense and, for convenience, will refer to both the middle and long range perspectives. Thus, "strategic planning" and "policy analysis" are treated as practically synonymous. A more detailed consideration of the subject, however, would compel that strategic planning and policy making be conceived as related but different activities, because policy analysis is always normative in nature while strategic planning may or may not be.

2. The Operation of Strategic Planning

Strategic planning involves directing a system's critical resources toward perceived opportunities in a changing environment. It is a parameter-

shaping act which is of key importance to the long-range. It consists of 1) the intellectual activities of perception, analysis, and choice which comprise decision making, 2) the social process of implementation through organizational structure, systems of measurement and allocation, and systems for reward and punishment, and 3) the dynamic process of revision as changes in resources and in the environment alter the context of the original policy problem.

All of these utilize information, and one very important aspect of strategic planning is producing and analyzing information. The question is always what is likely to happen in some area of concern at different points in the future. What challenges are likely to be presented and what will the major issues to the organization be? There is no way to answer these questions exactly, but likely possibilities can be outlined, and this gives a basis for preparing in advance for whatever contingency may be faced, and for creative acts now which help shape the future.

Strategic planning involves a good bit of expert judgment. Knowledgeable persons, including those who specialize in forecasting and other appropriate "futures" methodologies, use the most relevant available information and their own best judgment to outline the possible events which seem most likely in particular areas of concern. Using this type of information, decision makers predict what the consequences of various policies are likely to be, and they decide which set of consequences is most desirable (Naughton, 1975, p. 10).

A specific issue such as the use of technology in the schools is selected, and the best and most appropriate methodologies are used to prepare some limited number of likely events. No one supposes that any one of these is

exactly what will happen; rather, all appear to be possibilities, given what is currently known. By examining them, persons can decide which they find most desirable and, given the likely possibilities, what they would like to have happen. Then, those in decision-making roles, those who are interested in producing particular outcomes, can examine the scenarios for interrelationships and apparent causal factors. These in turn aid in understanding how decisions made now are likely to affect outcomes in the future. Through this process, decision makers can help to change probabilities.

Strategic planning is really a matter of changing the probabilities of outcomes. It is not a matter of predicting exactly what will happen or using any kind of magical process to cause particular things to occur, but simply of making informed decisions and thereby increasing the likelihood that what is desired is what actually occurs.

Note that a considerable task of reduction is involved in following this process. In a rapidly changing, unpredictable environment, an enormous variety of future states seems physically possible, and any decision maker attempting to deal with all of them would quickly be overwhelmed. The problem must be reduced to manageable size, but in a way which preserves those features which are relevant to the enterprise of concern.

This involves a cyclical process which includes:

1. Establishing which aspects of the environment are relevant and in what ways the organization interacts with them.
2. Forecasting conditions in this "problematic" environment (Beer, 1979, p. 237) which are likely at different times in the future.

3. Determining what the key issues to the organization are likely to be and how these relate to the different decisions which can be taken.
4. Forming strategies for meeting challenges and for pursuing goals.
5. Reviewing and evaluating the results of strategies as they are implemented.

C. The Tools of a Strategic Planning System

1. The General Systems Orientation

The long-range planning approaches of the 1950's and the 1960's are no longer adequate because of the great increase in uncertainty and turbulence in the environment. A basic planning system today must increase the scope, time horizon, and quality of the policy maker's awareness of both the external and internal factors that affect the future of the organization.

Such planning is possible only through a holistic approach or what is now known as a general systems orientation. This orientation implies that the total organization of interest and its environment must be taken into account systematically before control can be exercised optimally and before future-directed efforts can succeed.

This is true for at least two reasons. First, an understanding of how the organization operates internally, how it interacts with its environment, and how it responds to management decisions requires it. Second, it has been well established that modifying the behavior of a complex system requires a "system" of intervention. Little is accomplished ordinarily by changing just one or two things. The focus is on system stability and system reliability

rather than on characteristics of isolated components within the system (Chadwick, 1978, p. 406). In terms of causation, outcomes (or products) are conceived as a function of the way the total system is organized.

Concern both with key system components and with interactions among components is essential. As for which components to consider, Baldridge and Deal, writing from an organizational theory perspective, refer to organizational goals; technology, i.e., the procedures the organization uses to carry out its work; formal structure, including heirarchy of command, systematic decision processes, and reward processes; and human beings, both individuals and work groups (1975, pp. 10-14). Beer, from a management cybernetics perspective, uses basically the same substance but slices it in a very different way in his five-system model (1979). Very important in Beer's approach is the concept of recursion, which holds that the analytic and organizational principles are invariant across different system levels (1979, pp. 307-335). Any referent system consists of subsystems (components or parts) and is itself a subsystem of some larger system.

From this it becomes clear that, outside of the artificial milieu of the laboratory, trying to study or control individual components in isolation is predoomed to failure. It is also clear that the interconnectedness involved makes the problem complex even in relatively simple situations. A holistic approach is necessary, but at the same time, there must be some way to deal with the complexity this entails. Otherwise, would-be decision makers are soon desperately grasping for meaning in a morass of data, and their only choice very often is simply to ignore the data and proceed from a position of relative ignorance.

Another key concern always is the environment. Every organization survives and engages in goal-directed behavior through exchanges with its environment. The exchange almost always involves "things," such as raw materials, money, products, and services, and it involves information. The organization is much easier to operate and control if the environment is stable and predictable, for the obvious reason that decision makers know what to expect and can prepare for it well in advance. As the environment becomes more unpredictable, difficulties in management also increase because decision makers do not know what to anticipate. They may very well find themselves unprepared for what actually happens and facing one crisis after another, so that they are diverted from their longer-range purposes. At times, they even fail to survive. This is why a turbulent (unpredictable or very uncertain) environment requires more effective planning (Baker, 1973, pp. 163-246).

2. Information and Strategic Planning

a. General Purposes of Information

All organizations use information in planning and control (Chadwick, 1978, p. 333). Some need very little, however, and some need a great deal. To understand why there is a difference, it is necessary to realize that, at the most general level, the purpose of information is to reduce uncertainty. As uncertainty increases, the need for information also increases. More complex organizations inherently involve more uncertainty, as do more unstable environments.

Information flows internally, within the organization, and it is exchanged with the environment. One purpose of internal information is to

indicate the state of the organization at any point in time, that is, to let managers know what is currently happening. What is actually happening in key aspects can be compared to what is supposed to be happening and discrepancies noted and acted upon. Information on current states can be made part of a trend by comparing to what happened at different times in the past. Another purpose of internal information is to let management know what the capabilities of the organization are; what human and other resources does it have, and how effectively can these be used?

External information has two general purposes:

1. The first purpose is to reduce uncertainty about the environment, that is, to establish expectations as to what conditions are likely at different times in the future and what demands these will place on the organization.

2. The second purpose is to provide for knowledge transfer from external sources into the organization. This increases the organization's resource base and provides a wider range of responses with which to meet environmental challenges. This is referred to technically as increasing the variety pool.

It is clear from the preceding discussion that strategic planning depends heavily on certain types of information. Some of the uncertainty as to what may be faced must be reduced, and response capabilities must be increased accordingly. Futures methodologies are designed to help produce such information. What is <u>not</u> needed is tons of facts which overwhelm. The object in the information production activity is "to wring the maximal information out of the minimum data . . . (so that) the way the system is structured and is interacting is taken into account (Beer, 1966, p. 478)" and so that decisions are changed (Beer, 1979, p. 283).

b. Modeling as an Information-Producing Activity

The discussion to this point indicates that for strategic planning to be effective, information must be produced which:

.Provides an understanding of the organization and its operation,

.Allows the action of relevant parts of the environment to be described and future outcomes predicted, and

.Clarifies the interaction between organization and environment and projects the effects of different management-controlled organizational actions on this interaction.

Given the complexities that exist in large organizations and the uncertainties and turbulence in the environment, this is a difficult need to satisfy. Many organizations have attempted to respond by developing management information systems which produced mountains of data, but did little to increase understanding and control. Rather than help, in fact, this type of data can be harmful (Ackoff, 1967).

The only real chance of success in addressing this problem is through the use of models. A model may be described as a representation of a system by another system (Chadwick, 1978, p. 189). The model is similar in key aspects to the system it represents, but it is always reduced in complexity so that understanding is heightened. A model depicts the relevant aspects of the system of which it is intended to be a model, and it ignores the irrelevant aspects. It "reduces the problem space to its fewest dimensions" and thereby reduces "the number of decisions that have to be considered (Beer, 1966, p. 448)."

What is relevant depends on the purpose at hand. A model may be a physical representation (like a model train), it may exhibit representative

behavior (like a Link trainer), it may be a description in symbolic logic, or it may represent certain activities and outcomes in mathematical form. None of these is intrinsically superior to the other. The value of any of them in a particular situation depends on the information it produces and on the reduction in uncertainty which results.

In addition to explaining the here and now, a model has other crucial capabilities. Models also predict future outcomes and thus serve as a forecasting tool. They can serve a heuristic function by simulating the way that different possible decisions cause the system to respond to future environmental challenges.

Any strategic planning effort will have to make substantial use of modeling. Note, however, that the models do not have to be inordinately complex to be useful. The benefit of modeling lies in the understanding of the systems concerned and the knowledge that a model will give regarding possible decisions and the likely outcomes of these decisions, and these are not necessarily functions of any particular size of model.

It has been found, in fact, that the use of several smaller and simpler models which describe different aspects of a situation is likely to be more effective, cost wise and otherwise, than attempting to develop one large, complex model (Chadwick, 1978, p. 200). This seems to relate to a law of diminishing returns. A great deal of useful information is produced at relatively low cost with simpler models, but after a certain point in development of the individual model, a great deal of effort and expense is required to produce a small amount of additional information.

An effective model must be intelligible to those using it and must be adaptable to change. Comprehensive testing is needed to ensure that the

model's results are reliable, and throughout the operational use of the model there must be safeguards and control over the data used. The model must be flexible by allowing 1) additional variables to be incorporated whenever necessary, 2) use of elements which change over time, and 3) new relationships between variables to be introduced. It is also important that the model display results for easy visual comprehension, since outcomes will usually be intended for decision makers who are themselves not expert in modeling.

3. The Political Process and Strategic Planning

Strategic planning is also a political act. The policy maker must allocate scarce resources and must mediate among conflicting sets of values and interests. He must balance each individual issue off against a wide range of other issues, including not only those which presently exist but those that are likely to exist in the future. Almost inevitably, there is a process of negotiation in which a course of action acceptable to the different interests is selected. Bauer (1968, p. 15) points out that the interests of people and organizations are multiple and complex, and most policy problems are sufficiently complex that, given the objective features of the situation, organizations or individuals could wind up on any side of an issue. The idea of a single best solution is therefore misleading.

The political economist Wildavsky states that "the purpose of (policy) analysis is to connect knowledge with power, not ignorance with weakness (1979, p. 9)," and he notes that "the capacity to make decisions in the future, to mobilize support for substance--that is, political rationality--is at least as important as generating economic growth so that there will be resources to allocate (p. 1)."

Wildavsky says that the creative aspect of policy analysis consists in large part of finding a problem about which something can and ought to be done. "Problem finding is analogous to inventing or theorizing. In invention the task is not to compile a list of all unfulfilled human needs (or even the shorter list of those which deserve fulfillment), but to connect what might be wanted with what can be provided (p. 3)." The tools employed are qualitative political theory, quantative modeling, microeconomics, and macro-organizational theory (p. 4).

Wildavsky deals at some length with a matter that Beer and others have addressed, and that anyone who has ever been in a research position in an organization has experienced--that the persons in key power positions are seldom skilled in R&D and do not understand very well how policy-relevant information is produced. Because they realize that information represents power, however, they keep information specialists in "staff" positions with little or no decision authority, intending to use any useful information produced to their own advantage. But they seldom recognize what information is useful in the strategic sense. Thus there is always the dilemma of how to connect knowledge with power in strategic planning/policy analysis.

Many senior officers of organizations have no firm commitment to planning. Planning may be avoided because its relevance to present reality is hard to see. It is often perceived as a complex task, and managers may lack the discipline needed. Strategic planning is a creative, difficult process, and it is much easier just to "let things ride" and face issues on a crisis basis as they develop. This, of course, allows control in the long term to reside elsewhere, with those who are engaged in effective strategic planning.

4. Involving the Populace in Strategic Planning

The material covered so far in this paper is general and could be applied to any large, complex organization in today's rapidly changing world. Establishing a strategic planning capability in such a large organization is fairly straightforward, though of course it is not easy. Government is essentially different from other organizations, however, in that in the Western democracies, at least, a goal is to involve the total populace in the decision-making process.

The decisions discussed above are not to be accomplished in isolation or by some small group of super intellects. The people themselves are to participate in determining what the long-term goals are to be and how these goals are to be pursued

A problem is that many of the decisions today are highly technical and are not easily understood through casual effort (Wildavsky, 1979). This is one of the reasons that the age in which we live poses a serious threat to participatory democracy. The people themselves should determine the larger issues of societal values and lifestyles, and the government must involve them meaningfully. How to do this is one of the critical challenges.

Bertrand de Jouvenel, in thinking about this issue, proposed what he called a "Surmising Forum (Cornish, 1977, pp. 132-140)." This would be a kind of marketplace of ideas to which various speculations about the future could be brought, discussed, and criticized in order to create images of attainable and desirable futures. The legislators and the general public would debate the options, and political choices would be made early enough so that technical details could be worked out.

A deliberate attempt would be made at the local community level to organize groups of citizens. This could not be a governmental function, of course, but it could be handled by existing institutions such as churches and civic groups. These local groups would be furnished some of the strategic information discussed in the preceding section. Highly technical information would be rephrased in terms of implications for the society. Given the energy situation, for example, what real choices do we have, and what would each of these be likely to mean in the long range in terms of living standards, national independence, etc.?

This notion is not as far out as it seems at first glance, particularly with the rapid development of telecommunications. The home computer market is growing at astounding rates, and market projections are that half of the homes in the U.S. will have a microcomputer by 1985. Optic fibres and other technologies that are now being installed will mean that information can be exchanged with these microcomputers at very low cost. This will mean that, for the type of citizen involvement in strategic planning suggested here, very little travel would be necessary.

Note that information on key issues could be in more depth than is now possible through television and the newspapers. Further, information could be delivered to the microcomputer whether or not anyone was present. Information exchange, in other words, would not be dependent on both parties being present, as it is with the telephone. Another interesting possibility would be for governments to conduct quick surveys of a representative group of citizens with regard to key issues. Two or three rounds of a survey could be conducted in a single day.

D. Strategic Planning and Futures Methodologies

The discussion to this point emphasizes that strategic planning and the closely related area of policy analysis are activities which look to the future. Wildavsky (1979) states that these areas are prospective, seeking their rewards in the future (p. 15), and that they involve refining our picture of where we want to go and for systemizing guesswork on how to get there (p. 4). Beer (1979) notes that this is the arena not of reactive but of creative management, and that a goal is "inventing the future (p. 237)." Most people appear to believe that the future is something that will happen to us, he says, "whereas it is certainly open to humankind to take charge of these events." Strategic planning aims to take charge of future events.

A question so far as this paper is concerned is whether there are methodologies, used by strategic planners and others interested in creating the future, which are uniquely futurist. That is, is there a unique set of futures methodologies. Cornish suggests the answer when he observes:

> Futurists do not know what to call their subject. In fact, they are not even agreed on whether it is a science, an art, a philosophy, or something different from any of them (1977, p. 254).

Kauffman, in his very readable short book, Futurism and Future Studies (1976) allies futuristics very closely to general system theory. Hencley and Yates in Futurism in Education (1974) discuss as useful methodologies contextual mapping, force analysis, relevance trees, the Delphi technique, the cross impact matrix, the decision matrix, morphological analysis, trend analysis, and different types of forecasting--all of which may be seen as different types of modeling.

These are all legitimate methodologies and properly used, produce very valuable information. Those in strategic planning certainly should be conversant with all of them. They are not the unique preserve of persons who choose to call themselves "futurists," however.

The point is that, in this author's opinion, there is no seperate, identifiable set of "future methodologies." This is, for the most part, a trivial point. The question is whether strategic planners can produce information which causes policy-level decisions to be changed and which helps to take charge of future events, and it does not matter what the methodologies employed are called. The key is to use whatever methodologies are most appropriate and most efficacious.

On the other hand, people have displayed the penchant over the centuries for arguing (and even fighting) over semantics, and sometimes seemingly trivial matters can lead to decisions with disastrous consequences. Futurism has been treated by some writers as similar to crystal-ball gazing or tea-leaf reading. No self-respecting strategic planner would be caught at such activities, of course, and there is the danger that stereotyping could cause really useful methodologies to be ignored--or even actively avoided.

The fact is that strategic planning does use methodologies which are concerned ultimately with creating a particular type of future, and it is unmistakenly a futures activity. There is desperate need for decision makers in high places to realize that, for better or worse, and whether intended or not, their actions do create the future and that they bear a responsibility in this regard.

References

Ackoff, R.L. "Management Misinformation Systems." Management Science. 14:4 (December 1967) 147-156.

Anderla, Georges. Information in 1985. Paris: Organisation for Economic Co-operation and Development, 1973.

Baldridge, J. Victor, and Terrence E. Deal. Managing Change in Educational Organizations. Berkeley, CA: McCutchan Publishing Corporation, 1975.

Baker, Frank. Organizational Systems: General Systems Approaches to Complex Organizations. Homewood, IL: Richard D. Irwin, Inc., 1973.

Bauer, Raymond A. and Kenneth J. Gergen. The Study of Policy Formation. New York: The Free Press, 1968.

Beer, Stafford. Brain of the Firm. New York: Herder and Herder, 1972.

Beer, Stafford. Decision and Control. New York: John Wiley and Sons, 1966.

Beer, Stafford. The Heart of Enterprise. New York: John Wiley and Sons, 1979.

Bell, Daniel. The Coming of Post-Industrial Society: A Venture in Social Forecasting. New York: Basic Books, 1973.

Boulding, Kenneth E. The Meaning of the 20th Century. New York: Harper and Row, 1964.

Chadwick, George. A Systems View of Planning. New York: Pergamon Press, Inc., 1978.

Cornish, Edward. The Study of the Future. Washington, D.C.: World Future Society, 1977.

Heilbroner, Robert L. An Inquiry into The Human Prospect. New York: W.W. Norton and Company, 1975.

Hencley, Stephen P., and James R. Yates. Futurism in Education. Berkeley, CA: McCutchan Publishing Company, 1974.

Kast, Fremont E., and James E. Rosenzweig. "General Systems Theory, Applications for Organization and Management." Academy of Management Journal. 15:4 (December 1972) 477.

Kauffman, Draper L., Jr., Futurism and Future Studies. Washington, D.C.: National Education Association, 1976.

Mumford, Louis. Interpretations and Forecasts: 1922-1972. New York: Harcourt Brace Jovanovich, Inc., 1973.

Peterson, Russel W. "Impacts on Technology." American Scientist. 67:1 (January-February 1979) 280-282.

Soderbergh, Peter. "The Need for Better Balance in Educational Planning." (Speech given at the Louisiana State Planning Meeting, Southeastern Regional Consortium Planning Project, Baton Rough, Louisiana, February 7, 1979).

Toffler, Alvin. Future Shock. New York: Random House, 1970.

Wildavsky, Aaron. "No Risk is the Highest Risk of All." American Scientist. 67:1 (January-February 1979) 32-37.

Wildavsky, Aaron. Speaking Truth to Power: The Art and Craft of Policy Analysis. Boston: Little, Brown and Company, 1979.